

Use array formulas on massive data

Array formulas have one formula applied to the mass of data. Computation saving can be significant for large data sets.

Use consolidation functions

Consolidation functions perform calculations on data sets. SUM, SUMIF, SUMIFS, SUMPRODUCT are examples of consolidation functions. For example if you have a very long bill of materials (BOM), where quantity must be multiplied by unit price and then totaled to produce a cost figure, then instead of applying a formula on each entry of the BOM and then summing, you can use the formula SUMPRODUCT(quantity, unitprice), where quantity and unitprice are named ranges representing the BOM. SUMPRODUCT multiplies each cell of the quantity data set by its corresponding cell of unitprice and sums all the products.

Similar situations happen when you must sum a subset of the original data set, where you must apply a test on each entry to allow it to be part of the sum. For example, when the value is strictly positive. Use SUMIF(data_to_test;">0";data_to_sum), where data_to_test is the data set where you test the positive values, data_to_sum is the column where the values are to sum depending on the test, and ">0" is the test itself.

Other consolidation functions are AVERAGEIF, COUNTIF, MINIFS, MAXIFS, and more.

Use macros to create functions

Another strategy is to create your own functions and macros. This approach would be used where the result would greatly simplify the use of the spreadsheet by the end user and keep the formulas simple with a better chance of avoiding errors. This approach also can make the maintenance easier by having corrections or updates kept in one central location. The use of macros is described in Chapter 12, Macros, and is a specialized topic in itself. The danger of overusing macros and custom functions is that the principles upon which the spreadsheet is based become much more difficult to see by a user other than the original author (and sometimes even by the author!).

Multi-threading

Many modern computers have multi-core processors and provide for multiple threads. A core is a physical hardware component within a CPU. Threads are virtual components that help to efficiently manage the workload and tasks of the CPU. A CPU can interact with more than one thread at a time and multi-threading makes CPUs more efficient, to give better overall performance.

Calc supports multi-threading to help your spreadsheets take advantage of whatever parallel processing is available within your computer. This facility is controlled by the **Enable multi-threaded calculation** option in the *CPU threading settings* section of the **Tools > Options > LibreOffice Calc > Calculate** dialog. The initial default is for this option to be enabled, and disabling it is not recommended. This is the only control in the Calc user interface that relates to multi-threading; once initiated, the processing operates automatically.

If multi-threading is enabled, Calc automatically identifies where your spreadsheet could benefit from multi-threading and processes it accordingly. Threads are generally used for formula groups, where enough adjacent cells in a column use the same formula but get different results because of relative cell addressing. One implication of this approach is that the optimization is column-based and so a row-based layout could be less efficient.

There are other ways to control Calc's multi-threading capability, such as adjusting the MAX_CONCURRENCY LibreOffice specific environment variable. However, these methods are beyond the scope of this document.